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SAFETY FASTENER FOR BALL AND SOCKET HITCH

Be it known that I, RONALD E. PROFITT, a citizen of the United States and a resident of Kalispell in Flathead County in the State of Montana, whose Post Office address is 1093 Rose Crossing, Kalispell, Montana, 59901 have invented certain new and useful improvements in SAFETY FASTENER FOR BALL AND SOCKET HITCH of which the following is a specification and for which I pray the issuance of **utility Letters Patent.**

II. BACKGROUND OF INVENTION

IIA. RELATED APPLICATIONS

There are no applications related hereto heretofore filed in this or in any foreign country.

IIB. FIELD OF INVENTION

My invention relates generally to land vehicles and more particularly to a safety type fastener for a ball and socket type hitch coupling a first propelling vehicle and a second towed vehicle.

IIC. BACKGROUND AND DESCRIPTION OF PRIOR ART

When a first automotive type vehicle tows a second automotive type vehicle, especially such as a non-powered trailer, a hitch interconnecting the vehicles for effective operation must allow motion of each vehicle relative to the other in three mutually perpendicular planes while yet providing a strong, secure and safe interconnection. A common and popular hitch that accomplishes these ends is the so-called "ball and socket" hitch that provides a spherical ball carried by a depending bolt for fastening on

a rigid hitch bar carried by a first vehicle, commonly the towing vehicle, and a hitch structure, defining a hemispherical chamber to pivotally receive the ball, carried by a rigid hitch bar structurally interconnected to the towed vehicle. The hitch structure commonly provides a fastening arm that communicates with the associated ball at some portion of the hemispherical surface thereof that is not covered by the hemispherical chamber of the hitch to prevent the hitch from becoming accidentally disengaged from the ball.

This type of ball and socket hitch is simple of use, readily available, popular and widely used, especially with trailers of lower and medial gross weight. Notwithstanding its popularity, however, the ball and socket hitch is not completely reliable or safe in use as often the forces encountered in normal vehicle usage disengage the socket from the ball by disabling the fastening structure either by permanent or temporary reconfiguration. This problem has been recognized and dealt with in the past, most commonly by providing a secondary safety connection such as a chain between the propelling vehicle and towed vehicle to maintain interconnection of the vehicles. This solution,

though operative, is not completely satisfactory because the interconnection of the two vehicles is more loose with a chain interconnection which prevents proper towing and steerage of the towed vehicle to make continued towing, especially on roadways, quite dangerous.

This problem has heretofore been recognized and responsively various auxiliary safety devices have become known to operatively maintain the hitch socket on the associated ball. These known safety devices have generally been designed for, and are only effectively operative on hitches for lighter towed vehicles. In the modern day, however, the trend in both propelling vehicles and towed vehicles has been toward heavier vehicles and a need has risen to provide a safety fastener for heavier vehicles that still allows use of a ball and socket type hitch. The instant invention seeks to provide such a safety fastener to fulfill this need.

The instant safety fastener provides a body defining a channel that completely surrounds a hitch beam on which it is carried, with the bolt carrying the hitch ball extending through the body and the hitch beam carried therein to rigidly and securely fasten the body on the

hitch beam in an easily removable fashion. Most prior safety fasteners for lighter ball and socket hitches have not provided nor required such secure fastening of the safety fastener on the vehicle hitch bar.

Safety hitches that provide some structural element above the socket element of a ball and socket hitch to maintain interconnection of the socket hitch on the ball member have generally supported the structural element in a cantilever fashion, probably largely to prevent interference with motion of the socket element on the ball while yet allowing relatively free pivotal motion of either element relative to the other in three mutually perpendicular planes. The instant safety device in a first primary species provides two spacedly adjacent vertical arms carried in collars structurally supported by the hitch body for adjustable vertical motion with a horizontal fastening beam extending between the upper end portions of the vertical arms to provide a beam type element to restrain upward motion of the socket member of the hitch in a non-cantilevered fashion which provides substantial strength and rigidity. Subsequent experimentation allowed development of a second species of safety fastener having

a single L-shaped fastening arm with a vertical leg carried in a collar structurally supported by the safety fastener body for vertical adjustment and a perpendicular horizontal fastening arm extending over the socket member. A particular disclosed construction for this second species of safety device develops approximately seventy-five percent of the strength of the beam type fastener of the first species and is somewhat more simple of construction and use.

Though most ball and socket hitches for automotive vehicles have developed somewhat of a standardized configuration, there still are configurational variances between the hitches of various manufacturers. To accommodate these differences and allow use of the instant safety fastener on a substantial number of ball and socket hitches, it is necessary to make provision for adjustable vertical positioning of the horizontal fastening arm of the safety fastener relative to its base. The instant safety fastener meets this requirement by providing collars structurally supported by the fastener body for each vertical fastening arm so that the vertical fastening arms of either species of fastener may slidably move within the

collars for adjustable vertical positioning. A plurality of spaced vertical holes are defined in at least one of each collar or vertical arm body with at least one hole in the other element to allow a fastening pin to extend through a cooperating set of such opposed holes in both associated elements to releasably maintain adjustable vertical positioning of each vertical arm relative to the vertical arm collar carrying it. If desired, the vertical arm fastening pin may be of a headed type with a lock structure at the end distant from the head to allow locking of the pin in a cooperating set of adjustment holes to prevent unintentional removal of the socket element of a hitch from an associated ball and thusly prevent removal of a trailer from a propelling vehicle. Various prior safety fasteners have provided some means of adjusting the vertical position of a fastening arm relative to the hitch being fastened, but in general such prior fasteners have not used a pin and spaced hole type adjusting system with a key type lock to prevent unauthorized removal of the hitch elements from each other.

My invention resides not in any one of these features individually, but rather in the synergistic combination of

all of its structures which necessarily give rise to the functions flowing therefrom.

III. SUMMARY OF INVENTION

The instant safety fastener for ball and socket hitches provides a base defining a channel of rectilinear cross-section to receive and fit about the hitch beam of a vehicle with vertically oriented holes defined in the body to cooperatively receive the fastening bolt of the hitch ball for releasable fastening of the hitch ball and the body of the hitch tongue. The base carries two laterally spaced vertically oriented arm collars each defining vertical channels to receive slidably vertical fastening arms of a fastener structure for adjustable positioning therein. Each collar defines at least one set of diametrically extending pin holes and each vertical fastening arm defines a plurality of axially spaced diametrically extending fastening holes to cooperatively receive fastening pins extending through selected paired sets of pin holes in each collar and the fastening arm carried therein for vertically adjustable fastening of the fastening arms in the carrying collars. The vertical fastening arms structurally carry a horizontal fastening

beam, extending between their upper portion, for positioning over a portion of the hitch carried by the associated ball to prevent removal of the hitch from the ball. The fastening pins may be headed and carry a fastening device to prevent accidental removal of the pins from the collar carrying them and this fastening device optionally may be a lock type to prevent unauthorized removal of socket element from the ball of a hitch.

A second species of the safety fastener provides a body with only a single vertical arm collar adjustably carrying an L-shaped vertical arm for adjustable vertical fastening in the collar. A horizontal fastening arm extends from the lower portion of the vertical arm with a fillet extending between the inner part of the lower surface of the horizontal fastening arm to the adjacent surface of the upper portion of the vertical arm.

In creating such a device it is:

A principle object to provide a safety fastener for ball and socket type hitches interconnecting vehicles of medial to heavy gross weights.

A further object is to provide such a safety fastener that has adjustable features that allow use with various

ball and socket hitches of present day commerce without reconfiguration of the safety fastener, ball and socket hitches or existing tongue beams of propelling or propelled vehicles.

A further object is to provide such a safety fastener that has a base carried by hitch beam of a propelling vehicle which in turn carries a vertically adjustable fastening beam extendable over the socket element of the hitch so that the fastening beam may be locked in place over the socket element of the hitch to prevent accidental or unauthorized removal of the socket element from the associated ball.

A still further object is to provide such a safety fastener that is of new and novel design, of rugged and durable nature, of simple and economic manufacture and one otherwise well suited to the uses and purposes for which it is intended.

Other and further objects of my invention will appear from the following specification and accompanying drawings which form a part hereof. In carrying out the objects of my invention, however, it is to be understood that its essential features are susceptible of change in design and

structural arrangement with only preferred practical embodiments of the best known modes being illustrated and specified as is required.

IV. BRIEF DESCRIPTIONS OF DRAWINGS

In the accompanying drawings which form a part hereof and wherein like numbers of reference refer to similar parts throughout:

Figure 1 is an isometric view of the outer end portion of a typical outer end portion of a hitch bar structure of a propelling vehicle carrying a ball and socket type hitch with a portion of the outer surface of the socket member shown on the ball.

Figure 2 is a vertical elongate cross-sectional view in operative position hitch structure such as that of Figure 1, taken on the line 2-2 through in the direction indicated by the arrows, to show the structure and operation of a typical ball and socket hitch.

Figure 3 is an isometric view of the first species of my safety fastener in operative position on a ball and socket type hitch such as of Figures 1 and 2.

Figure 4 is an isometric view of the safety fastener of Figure 3 isolated from the ball and socket hitch to better show its parts, their configuration and relationship.

Figure 5 is an isometric view of the base member of

the first species of the safety fastener of Figures 3 and 4.

Figure 6 is an orthographic top plan view of the base member of Figure 5.

Figure 7 is an orthographic front view of the base member of Figure 5.

Figure 8 is a broken vertical cross-sectional view of the base member of Figure 5 taken on the lines 8-8 thereon in the direction indicated by the arrows.

Figure 9 is an isometric view of the fastening beam member of the first species of the safety fastener of Figures 3 and 4.

Figure 10 is an orthographic top plan view of the fastening beam member of Figure 4.

Figure 11 is an orthographic front elevational view of the fastening beam member of Figure 9.

Figure 12 is a broken vertical cross-sectional view through the fastening beam member of Figure 9, taken on the line 12-12 thereon in the direction indicated by the arrows.

Figure 13 is an isometric view of the second single arm species of safety fastener in operative position on a

ball and socket type hitch as illustrated in Figures 1 and 2.

Figure 14 is an isometric view of the second species of the safety fastener of Figure 13 isolated from ball and socket hitch shown in Figure 13 to show its parts, their configuration and relationship in more detail.

Figure 15 is an isometric view of the base member of the safety fastener of Figure 14.

Figure 16 is an orthographic forward elevational view of the base member of Figure 15.

Figure 17 is an orthographic top plan view of the base member of Figure 15.

Figure 18 is an isometric view of the fastening arm member of the safety fastener of Figure 14.

Figure 19 is a vertical cross-sectional view through the horizontal fastening member of Figure 18, taken on the line 19-19 thereon in the direction indicated by the arrows.

Figure 20 is a horizontal cross-sectional view through of the fastening beam of the fastening member of Figure 18, taken on the line 20-20 on Figure 19 in the direction indicated by the arrows thereon.

Figure 21 is an isolated enlarged expanded isometric view of the lockable pin structure shown in of Figures 13 and 14.

V. DESCRIPTION OF THE PREFERRED EMBODIMENT

A typical vehicular hitch structure **30** for ball and socket hitch **35** with which my safety fastener is operative is illustrated in Figures 1-3. The frame of a pulling vehicle (not shown) supports a rearwardly extending square box beam **36** configured to slidably carry square hitch beam **37** in its internal channel. The beams **36,37** each define cooperating pairs of fastener holes **38** extending horizontally through the opposed vertical sides of each beam **36,37** to receive pin type fastener **39** therethrough to releasably interconnect hitch beam **37** within the channel of box beam **36**. The rearward end portion of hitch beam **37** structurally carries hitch tongue **40** having forward angulated portion **40a** and rearwardly horizontal extending portion **40b**. The medial portion of the hitch tongue **40** defines ball fastening hole **41** extending vertically therethrough to receive the fastening bolt of a ball member of a ball and socket hitch. This type of hitch beam **40** allows 180° rotation for placement in the channel of box beam **36** so that the horizontal portion **40b** of the hitch tongue may be selectively positioned at a higher or lower position relative to box beam **36**.

The ball and socket hitch structure **35** provides a ball member having spherical ball **42** supported on base **43** so that more than half of the spherical surface of ball **42** is exposed. Fastening bolt **44** depends from base **43** to define a lower threaded portion which carries nut **45**. For use the fastening bolt **44** is inserted through fastening hole **41** defined in hitch tongue **40**, as illustrated in Figure 2, and nut **45** is placed thereon to fasten the ball member in the hitch tongue **40**, commonly with one or more cylindrical washers **46** extending between the upper surface of nut **45** and lower surface of hitch tongue **40** to allow accommodation of hitch tongues of different thicknesses.

The hitch member of ball and socket hitch **35** provides U-shaped hitch beam **47** having a spherical forward end portion **47a** to fit upon the upper portion of the spherical surface of ball **42**. The hitch beam **47** extends spacedly rearwardly from the ball member for structural support on the tongue beam of a trailer or other vehicle to be towed (not shown).

Medial channel **48** defined by hitch beam **47** carries a fastening structure to releasably maintain hitch beam **47** in movable interconnection with spherical ball **42**. This

fastening structure commonly provides over center lever **49** carried for pivotal motion by bracket **50**. The over center lever **49** pivotally carries depending fastener link **51** and release lever **52**, which may be pivoted into and out of connection with fastening link **51**. Fastening arm **53** has depending forward portion **53a** configured to communicate with ball **42**, horizontal arm **53b** extending spacedly rearwardly beyond fastener link **51** which is carried in a hole defined in horizontal arm **53b** and mounting bracket **53c** which extends upwardly from arm **53b** to receive pin **54** which pivotally mounts the fastening arm **53b** on the hitch beam **47**. The lower portion of fastener link **51** defines a threaded portion to receive nut **55** supporting cup type washer **56** on its upper surface to support cylindrical extension spring **57** extending between the upper surface of washer **56** and the lower surface of fastening arm **53** to bias the fastening arm upwardly.

With this mechanism when over center lever **49** in the forwardly extending horizontal down position illustrated in Figure 2, fastening arm **53** will be in the position illustrated in Figure 2 with depending fastening portion **53a** immediately adjacent ball **42** to fasten the hitch member

on the ball member. When the over center lever **49** is pivoted upwardly and rearwardly the fastening arm **53** will be moved downwardly to release depending forward portion **53a** from its fastening position adjacent ball **42** to allow removal of the hitch beam **47** from the ball **42**.

Though the foregoing illustrated and described fastening mechanism is common to various presently commercially available ball and socket hitches, the description of this particular fastening mechanism is not intended to be limiting, but rather is intended only to describe background to show the use environment of my safety fastener. The use of my safety fastener on other compatible ball and socket type hitches having other fastening mechanism is within the spirit and scope of the instant invention.

The first species of my safety fastener, as seen in Figures 3 and 4, provides base **31** carrying vertical fastener arm collars **32** to receive vertical fastener arms **33** carrying horizontal fastening beam **34**.

Base **31** is somewhat of a four sided peripherally defined box without ends formed by bottom **58** interconnecting upstanding similar sides **59** which in turn

interconnect top **60** extending therebetween, all to define medial channel **61**. The dimensioning of the base elements **58,59,60** is such as to define the medial channel **61** over and about to fit the rearward portion **40b** of hitch tongue **40** slidable motion, as illustrated in Figure 3. The bottom **58** is somewhat longer in a forward direction than top **60** to allow use of the safety fastener on hitch tongues **40** having rearward horizontal portions of **40b** of varying lengths so as not to interfere with forward angulated portion **40a** of the hitch tongue. The medial portion of top **60** defines hole **62** to receive fastening bolt **44** of ball **42** therethrough. In bottom **58** defines somewhat larger hole **63**, axially aligned with hole **62**, to receive the fastening bolt **44** therethrough. Both holes **62,63** are laterally positioned so that they will be co-axial with hole **41** defined in hitch tongue **40** when the hitch tongue is positioned within channel **61** defined by the base **31**. Commonly in substantially all vehicular hitch structures **30** the hole axes are positioned along a medial line.

Vertical arm collars **32** are tubular elements formed with a circular cylindrical bodies **64** defining medial channel **65**, as seen in Figures 4 and 8. Each cylindrical

body **64** defines a plurality of vertically spaced diametrically opposed fastener holes **66**. Each collar body **64** is structurally carried in its axially medial portion on the outer surface of body sides **59** near the forward end portions of the sides **59**. Each vertical arm collar **32** carries a fastening pin **67** extending through a cooperating pair of holes **66**. In the instance illustrated, fastening pin **67** provides cylindrical body **67a** with head **67b** at one end and acuate resiliently deformable fastener **68** extending from pivotal interconnection with head **67b** with looped end portion **68a** fastenable over the opposite end of pin body **67a** as illustrated for maintenance of the pin **67** within the fastening holes **66** carrying it.

Vertical arms **33** of the fastening structure, seen in detail in Figures 9-12, are similar elongate circularly cylindrical rods **69** of a diametrical size to slidably fit within channels **65** of vertical collars **32**. The lower portions of each rod **69** define a plurality of axially spaced holes or slots **70** to receive the body **67a** of a fastening pin **67** therein and allow that fastening pin to pass through a set of the paired opposed fastening holes **66** to positionally maintain the vertical arms **33** in a selected

vertical position in vertical arm collars **32**.

Horizontal fastening beam **34** provides planar body **71** extending between and structurally carried by the upper end portions of vertical arm rods **69**. The body **71** is somewhat elongate with a major extending laterally. The forward facing edge of the body **71** defines rectilinear notch **72** to allow the body **71** to be positioned lower or nearer to base **31** without being interfered with by the forward adjacently lower angulated portion **40a** of hitch tongue **40**. The forward portion of body **71** defines forwardly extending fastening protuberance **73** to extend forwardly to a position over forward portion **47a** of hitch beam **47** and preferably has downwardly and forwardly sloping upper surface **73a**. The protuberance **73** prevents upward motion of hitch beam **47** away from ball **42**, without interfering with socket member fastening structure **49,50,52** or preventing horizontal turning motion of the hitch beam.

A second species of safety fastener providing only a single vertical arm for support of a fastening beam is illustrated in Figures 13-20 where it is seen to provide base **31a** for fastening on vehicle hitch structure **30** that is the same as the base **31** that was provided by the first

species of safety fastener having two spaced vertical arms **33** and the base **31a** of the second species operates in the same fashion for attachment on the hitch structure **30** to be serviced.

The second species of safety fastener provides a single vertical arm collar **32a** that is the same as one of the two vertical arm collars **32** of the first species of safety fastener. The vertical arm collar **32a** may be fastened on either similar side **59** of base **31a** by welding in the same fashion as the vertical arm collar **32** would have been fastened in the first species of the safety fastener.

The second species of safety fastener provides a different vertical arm **74** and horizontal fastening beam **75** that in the instance illustrated are unitarily formed from a unitary body rod **76**. The vertical arm **74** of the body rod **76** provides a circularly cylindrical cross-section sized to slidably fit within channel **65** defined by body **64**. Vertical arm **74** defines a plurality of diametrically extending vertically spaced fastening pin holes **77**. These holes **77**, if desired for convenience of manufacture, may be formed as semi-circular slots extending from the medial

axially aligned hole position radially outwardly through a semi-circular portion of vertical arm 74, such as was illustrated in Figures 3-4. The fastening pin holes **77** are substantially of the same diametrical size as the fastening pin holes **66** defined in vertical arm collar **32a** to slidably receive fastening pin **78** (Figures 13,14) extending through an aligned set of the fastening pin holes **66,77**.

This angulation allows the axis of holes **66** in vertical arm collars **32a** to be parallel to sides **59** of body **31a** while yet allowing horizontal fastening beam **75** to angulate with plane **79** through the axes of holes **77** extending toward base **31a** to assure contact of the outer end portion of horizontal fastening beam **75** with the upper surface of forward portion **47a** of the socket member of ball and socket hitch **35**.

The upper part of vertical portion **76a** of body rod **76** forms bend **76b** to provide horizontal fastening beam **75** formed by horizontal portion **76c** of the body rod **76** such that the axis **80** of the fastening beam **75** is substantially perpendicular to the axis **81** of vertical portion **76a**, as seen in Figure 19.

Preferably when fastening pin holes **77** are created a

plane **79** through the axes of the holes will be angulated at an acute angle of about 20° to 30° to the axis **80** of the horizontal portion **76c** of body rod **76**, as illustrated in Figure 20.

The adjacent inner surfaces of body rod bend **76b** are reinforced by triangular-like fillet plate **82** which is structurally fastened to the adjacent surfaces of body rod **76** by welding **83**. The size of this fillet plate **82** cannot be sufficient to interfere with the extension of horizontal portion **76c** of the body over the upper forward spherical portion **47a** of hitch beam **47** which usually limits the fillet plate **82** to an extension along the lower surface of horizontal portion **76c** of not more than approximately one-third the length of the horizontal portion **76c**, substantially as illustrated.

The axial length of vertical portion **76a** of body rod **76** must be such as to allow positioning of the lower surface the horizontal portion **76c** of the body rod at a level vertically co-planar with the upper surface of forward spherical portion **47a** of hitch beam **47** when the vertical portion **76a** is in a fastenable position within body **64** of vertical arm collar **32a**. Similarly the axial

length of horizontal portion **76c** of the body rod must be sufficient to extend to a fastenable position over the top of forward spherical portion **47a** of hitch beam **47**.

Preferably the upper outer surface of horizontal portion **76c** of body rod **76** is removed to form an outward and downwardly tapering surface **84** to aid in preventing any interference of the horizontal portion **76c** of the body with the fastening mechanism of hitch beam **47**. Preferably the lower outer end part of horizontal portion **76c** of body **76** is removed in an upward and forwardly extending fashion to provide surface **85** as illustrated in Figure 19, to provide a better fit on the upper surface of the forward spherical portion **47a** of the hitch beam **47**. Neither of the aforesaid configurations of the outer end part of horizontal portion **76c** of the body rod **76** are necessary, however, and the mechanism is operable without them.

Fastening pin **78**, illustrated in Figures 13, 14 and 21, is somewhat different from fastening pin **67** illustrated and described with the first species of safety fastener. The fastening pin **78** is an L-shaped pin having longer cylindrical body **86** with substantially perpendicularly extending fastening arm **87** at a first end. The diameter of

body **86** is such as to slidably fit within fastening hole **66** of vertical arm collars **32a** and cooperating fastening pin holes **77** defined in vertical portions **76a** of body rod **76**. The second outer end portion of body **86** defines truncated conic point **88** with fastening groove **89** defined spacedly axially inwardly from the conic point **86**. The second fastening end portion **88,89** of fastening pin **78** is adapted to be received in lock box **100**. The axial length of body **86** is somewhat greater than the distance between the inner surface of lock box **100** and the adjacent surface of fastening arm **87** to allow the fastening pin **78** to extend through a cooperating pair of fastening holes **66** in vertical arm collar **32a** and be fastened therein with lock box **100** one side of the vertical arm collar **32a** and fastening arm **87** on the outer side of that collar **32a**. The lock box **100** illustrated is one having a cylindrical key-operated lock with a locking lug (not shown) adapted to fit within fastening groove **89**. This type of lock box **100** is well known, commercially available in the modern day marketplace and therefore not described in detail.

Having described my invention its use may be understood.

The operation of either first or second species of my invention is substantially the same. A safety hitch of either species is created according to the foregoing specification and drawings with either a single vertical arm collar **32a** on one side **59** of base **31a** or two vertical arm collars **32** in laterally opposed orientation on the outer forward sides **59** of the base **31**.

The body **31** or **31a** then is attached to hitch tongue **40** of ball and socket hitch **35** by removing nut **45** from fastening bolt **44** and removing the ball element from the hitch tongue **40**. Body **31** or **31a** is then placed about the hitch tongue with that tongue extending through channel **61** so that hole **41** in the hitch tongue **40** is aligned with hole **62,63** in the rearward portion of base **31** or **31a**. The ball element then is re-established by placing its fastening bolt **44** through holes **62,41,63** and re-establishing nut **45** in the lower end portion of the bolt.

The socket member of ball and socket hitch **35** is then fastenably established on the ball portion of that hitch **35** in the fashion as heretofore known for the particular ball and socket hitch elements being serviced.

The vertical arm or arms **74,32** are then established in

channels **65** of vertical arm collars **32a,32**, as the case may be, and are vertically positioned so that horizontal fastening beams **34,75** are immediately above the upper surface of the forward spherical portion **47a** of hitch beam **47** of ball and socket hitch **35**. When the vertical arms **74** or **32** are in this position, either fastening pin **67** or **78**, as the case may be, are inserted through an opposed pair of fastening holes **66** defined in vertical arm fastening collars **32** or **32a**, and the axially aligned fastening holes **70,77** defined in the vertical arms **33** or **33a** which fasten the horizontal fastening beam **34** or **75** in as near as possible to the desired fastening position. Fastening pin **67** or **78** is then fastened for positional maintenance of the vertical arms **33** or **33a** in collars **32** or **32a** as hereinbefore specified, and the safety fastener is then installed and ready for use.

In using either safety fastener as described, it is to be noted that horizontal fastening beams **34** or **34a** will be immediately above the socket member of ball and socket hitch **35** and that the horizontal fastening beams cannot move upwardly by reason of their ultimate support on hitch tongue **40** which carries the ball element of the ball and

socket hitch **35**, so that the hitch element may not move upwardly sufficiently to become disengaged from the ball element, without breakage of either the ball and hitch structure or the safety fastener structure.

It is further to be noted that the second single vertical arm safety fastener in the form specified has approximately 75% of the strength of the first species having two spacedly related vertical arms when formed with comparable elements of the same size and strength, while the first species of safety fastener is somewhat more simple of use and cheaper of manufacture. The first species of the safety fastener having two vertical arms serves well for use with heavy trailer vehicles while the second species serves better with medium trailer structures.

The foregoing description of my invention is necessarily of a detailed nature so a specific embodiment of it might be set forth as required, but it is to be understood that various modifications of detail, rearrangement and multiplication of parts might be resorted to without departing from its spirit, essence or scope.

Having thusly described my invention, what I desire to